LYCOPERDON UMBRINOIDES DISSING & LANGE *(GASTEROMYCETES)*, A TROPICAL FUNGUS PRESENT IN EUROPE

by

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Summary. CALONGE, F.D., J.M. VIDAL & V. DEMOULIN (2000). Lycoperdon umbrinoides Dissing & Lange (Gasteromycetes), a tropical fungus present in Europe. *Bol. Soc. Micol. Madrid* 25: 55-58.

Lycoperdon umbrinoides Dissing & Lange, a species previously known in the tropics, is mentioned for the first time in Europe. The material studied was found in the province of Gerona, NE Spain, growing in soil of *Lamio-Alnetum glutinosae*. It also seems to occur in the SW of France. Comments on its relationships with close species are also added.

Key words: *Lycoperdon umbrinoides, Gasteromycetes,* taxonomy, chorology, Spain, Europe.

Resumen. CALONGE, F.D., J.M. VIDAL & V. DEMOULIN (2000). Lycoperdon umbrinoides Dissing & Lange (Gasteromycetes), un hongo tropical presente en Europa. *Bol. Soc. Micol. Madrid* 25: 55-58.

Lycoperdon umbrinoides Dissing & Lange es una especie que solo se conocía hasta ahora en Africa tropical, y se cita aquí por primera vez para Europa. El material estudiado se encontró en la provincia de Gerona, NE de España, creciendo en el suelo de *Lamio-Alnetum glutinosae*. También parece estar presente en el SO de Francia. Se aportan comentarios sobre sus afinidades con especies próximas.

Palabras clave: *Lycoperdon umbrinoides, Gasteromycetes,* taxonomía, corología, España, Europa.

INTRODUCTION

Lycoperdon umbrinoides was proposed as a new species by DISSING & LANGE (1962), using as type material specimens collected in Congo. The specific epithet refers to its resemblance with *L. umbrinum* Pers.: Pers. However, the presence of non-pored capillitium in *L. umbrinoides* separates this species from *L. umbrinum*.

In 1996 VIDAL & CALONGE published a paper where they showed the possible presence in Spain of *Lycoperdon atrum* Pat., a neotropical species. Later studies on this subject demonstrated that most of the basidiomata collected were unripe or with atypical development. Finally, new findings enabled us to identify our collections with *Lycoperdon umbrinoides* Dissing & Lange.

The material studied is preserved at the herbarium MA-Fungi, of the Real Jardín Botánico, Madrid. Some material is kept in the herbaria JMV and in LG.

Lycoperdon umbrinoides Dissing & Lange, Bull. J. Bot. État Brux. 32: 344 (1962)
= *Lycoperdon ashantiense* Dring, Mycol. Papers 98: 42 (1964)
= *Lycoperdon atrum* Pat., sensu Vidal & Calonge, Bol. Soc. Micol. Madrid 21: 375, figs. 1-8 (1996)

Material studied. SPAIN. GERONA: Sant Sadurní de L'Heura, riverbank Daró, 70 m, leg. *J.M. Vidal*, 8-XI-1995, sandy soil, under *Robinia pseudoacacia, Quercus ilex, Alnus glutinosa* and *Fraxinus angustifolia*, MA-Fungi 35530; ibídem, leg. *J.M. Vidal*, 26-X-1998, MA-Fungi 41423. Sant Gregori, Santa Afra, leg. *J. Carbó & M.A. Pérez de Gregorio*, 31-X-1998, sandy soil under *Phytolacca americana*, MA-Fungi 41872. Sant Sadurní de l'Heura, beside Rissec river, under *Quercus ilex, Q. suber, Robinia pseudoacacia, Alnus glutinosa* and *Crataegus monogina*, leg. *J.M. Vidal*, 6-I-1987, MA-Fungi 21975.

Basidioma pyriform (figs. 1, 2), 2-4 × 2-3.5 cm, with rhizomorphs up to 5 cm long. *Exoperidium* made of clusters of 1-1.5 mm high, dark, spines, with tips connivent dark brown, but much paler towards the base where they become yellowish cream (figs. 1, 2). *Endoperidium* papery, soft, brownish chocolate, dull or shining, smooth in part. *Gleba* cottony, brownish violet. *Subgleba* cellular in young basidiomata, changing to almost compact with age, with some residual locules at base, pale brown.

Fig. 1.–Basidiomata of *Lycoperdon umbrinoides* as they grow in nature (MA-Fungi 41872). Foto: J. Carbó y M.A. Pérez de Gregorio.

Fig. 2.–Basidiomata of *Lycoperdon umbrinoides*. Section of a basidioma (center of photography) showing a violet gleba and a pinkish subgleba (MA-Fungi 41423). Foto: J.M. Vidal.

Under the microscope, spines of the exoperidium are made up of sphaerocysts of variable size, from more or less isodiametric to setiform, up to 60 × 12 µm, with a thick wall that can reach 2.5 µm in chloral hydrate and a fast brown internal pigment. The top, which may be caducous, is mostly made up of thin-walled (hence usually collapsed) elongated elements, for example 64 × 10 µm. There may be a transitional zone with sphaerocysts of various shape and wall thickness. Capillitium dichotomously branched, undulating in zones, brown, devoid of pores, of average diameter (up to 4.0-5.6 µm) and wall thickness (up to 0.8-1.2 µm). Spores globose 3.6-4.2-4.7-5.0 µm (without the ornamentation), with moderate warts 0.2-0.4 µm long, rather dense (11-15 for a circumference). Elongated cells which seem to be persistent basidia, up to 14 × 8 µm (sometimes only 8 × 5 µm), are mixed with the spores, so as variably well preserved pedicels (fig. 3).

DISCUSSION

The material we are revising now has recently been published, under the name of *Lycoperdon atrum* Pat., by VIDAL & CALONGE (1996). A complete description with extensive iconography was presented in that paper. However, later we realized that the majority of the basidiomata were unripe or showed an abnormal development.

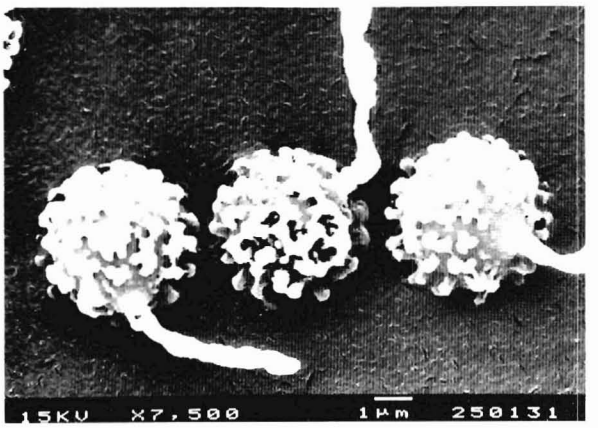

Fig. 3.- Spores of *Lycoperdon umbrinoides* showing pedicels (MA-Fungi 41872).

Subsequent collections of mature specimens, from the same locality and a new one, have made possible the identification of the Spanish material with *L. umbrinoides* (DISSING & LANGE, 1962) and with its synonym *L. ashantiense* Dring (DRING, 1964). The synonymy of those two species and identity with the Spanish material is suggested by the original descriptions, but one discordant element is the mention of pits in the capillitium of *L. ashantiense*. This is, obviously, a slip of the pen, using the term "pits" instead of "tips", as checked by one of us (VD) on a part of the type collection when published the synonymy (DEMOULIN, 1976). The types of *L. umbrinoides* (BR) and *L. ashantiense* (K), both studied by one of us (VD) are, in fact, extremely similar and differ slighly from the Spanish material by presenting more conspicuous spines. Well developed spines are only present on some of the Spanish specimens. They further present similarly small spores (3.4-3.7-4.0 µm) for one of the ripest specimens of the type collection of *L. umbrinoides*, and 3.4-3.8-4.2 µm for the part of the type of *L. ashantiense* (LG). In this group of species it is probable that a difference in spore size of the magnitude observed between the African and Spanish material is not of a major taxonomic significance. This has already been discussed by DEMOULIN (1976) for *L. juruense* (as *L. atrum*) where some collections present a spore volume double from others. This, probably, answers a doubling of the number of nuclei. In the present case one will observe that spore diameters of 3.7 and 4.7 µm represent a ratio of 1:2 in spore volume.

At the gleba level, as emphasized by DEMOULIN (1976), there does not seem to be any difference with *L. atrum* Pat. non Schaeff. (for which the correct name is, presently, *L. juruense* P. Henn). The difference lies in the exoperidium, which up to now has never been observed to be made up of blackish thin spines in the neotropical taxon *L. juruense*, which further often presents sphaerocysts with a thicker wall (up to 4 µm in chloral). Some specimens from the New World and from Europe are however very similar and one cannot completely rule out that one deals with a highly variable circumtropical species, for which the variability has not been sufficiently sampled until now. Another possibility is that several microspecies exist, for which good discriminating characters remain to be discovered. One should add that material from this group has been observed in Papua New Guinea by one of us (VD), but has not been studied yet.

A feature that has not been discussed previously and was observed on the Spanish material is the presence of strong rhizomorphs. Retrospectively this has been confirmed by one of us (VD) on specimens and photographs of both, *L. juruense* and *L. umbrinoides*, including the type (see the photograph pl. XXXIX, fig. 3, Dissing & Lange, *Flore Iconographique des Champignons du Congo 12, Gasteromycetales* I: 215-232, pl. XXXVIII-XL, Jardin Botanique de l'Etat, Bruxelles, 1963). This makes the species confusable from a distance with *L. atropurpureum*, from which it is easily differentiated under the microscope by the spores, capillitium and sphaerocysts.

Concerning the geographical distribution of *L. umbrinoides* and *L. juruense* (= *L. atrum*), one should note that a first report for Europe of *L. atrum*, has been claimed by CETTO (*I funghi dal vero*, 7: 759, pl. 2869, Arti Grafiche Saturnia, Trento, 1993). This is, however, based on a photograph of completely unripe specimens without any indication of microscopical details. Even if this could be *L. umbrinoides* it could also be *L. umbrinum* or *L. atropurpureum* Vittad.

An interesting record is a fragment of an un-

ripe specimen, which shows an exoperidium similar to that of some Spanish collections, found by Gumberteau, "Villandraut", Préchac, Gironde, France, 9-X-1999, *Mornand 99* 13G, dupl. in LG (MORNAND, pers. comm.). This was also growing in a small valley with nitrophilous vegetation, including *Sambucus* and *Robinia.*

Our present feeling is that one deals with two closely related vicarious tropical species, *L. juruense* (= *L. atrum*) in America and *L. umbrinoides* in Western Old World. Both occasionally extend into subtropical to warm temperate areas (Uruguay and Florida for *L. juruense*, SW Europe for *L. umbrinoides*). Its introduction in Europe seems to be recent, since the species has not been observed in the available herbarium material of European *Lycoperdon* (more than 5,000 collections) revised by one of us (VD). The possibility of a link to a recent warming trend in Southern Europe is worthwhile considered.

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